

CLAIMS

1. (previously presented) An aeration/backwash device for use with a porous membrane filtration module comprising one or more membranes having opposing potted ends, each of the one or more membranes having a permeable wall which, in use, is subjected to a filtration operation wherein feed containing contaminant matter is applied to one side of the wall and filtrate is withdrawn from the other side of the membrane wall, the aeration/backwash device adapted to at least partially surround a portion of said membrane module and including a communication chamber having spaced through-openings in fluid communication with said chamber and the membrane module, wherein, in use, gas is supplied to the chamber and communicated to the membrane module through the through-openings in a direction substantially perpendicular to a longitudinal axis of said membranes to provide a substantially even cross flow gas distribution for aerating the membranes within the membrane module and liquid backwash is withdrawn from and/or fed into the membrane module through said through-openings into said chamber.
2. (original) An aeration/backwash device according to claim 1 wherein the gas and liquid backwash are selectively communicated through the same through-openings.
3. (previously presented) An aeration/backwash device according to claim 1 wherein the through-openings are vertically spaced through-openings in fluid communication with said chamber and the membrane module, and wherein, in use, gas is supplied to the chamber and communicated to the membrane module through at least the upper of said through-openings to aerate the membranes within the membrane module and liquid backwash is withdrawn from the membrane module through the lower of said through-openings into said chamber.
4. (original) An aeration/backwash device according to claim 3 wherein backwash or feed liquid is fed or injected into the base of the module through the lower openings or both set of openings.

5. (original) An aeration/backwash device according to claim 4 wherein the backwash and/or feed liquid is used to sweep solids along the membranes to carry out solids backwashed off the membrane surfaces during said aeration.
6. (previously presented) An aeration/backwash device according to claim 1 wherein the vertically spaced through-openings include an upper and lower set of through-openings.
7. (previously presented) An aeration/backwash device according to claim 6 wherein the upper openings are smaller in cross-sectional area than the lower openings.
8. (previously presented) An aeration/backwash device according to claim 6 wherein the openings of each set of through-openings are axially spaced around the periphery of the chamber.
9. (previously presented) An aeration/backwash device according to claim 6 wherein the liquid backwash is withdrawn from and/or fed through both sets of through-openings.
10. (previously presented) An aeration/backwash device according to claim 1 wherein the device is formed as an annulus.

11. (previously presented) A porous membrane filtration module including one or more membranes extending longitudinally between vertically spaced upper and lower headers into which the ends of the membranes are potted, the membranes having a permeable wall which, in use, is subjected to a filtration operation wherein feed containing contaminant matter is applied to one side of the membrane wall and filtrate is withdrawn from the other side of the membrane wall, the upper and lower headers being in fluid communication with one or both of the ends of said membranes and at least one associated upper and/or lower filtrate collection chamber such that, in use, filtrate withdrawn from said other side of the membrane wall is communicated through at least one of the upper and/or lower header to the associated upper and/or lower collection chambers, an aeration/backwash device at least partially surrounding a portion of said membrane module and including a communication chamber having spaced through-openings in fluid communication with said communication chamber and the membrane module, wherein, in use, gas is supplied to the communication chamber and communicated to the membrane module through said through-openings in a direction substantially perpendicular to a longitudinal axis of said membranes to provide a substantially even cross flow gas distribution for aerating the membranes within the membrane module and liquid backwash is withdrawn from and/or fed into the membrane module through said through-openings into said communication chamber.

12. (previously presented) A porous membrane filtration module according to claim 11 wherein the through-openings are vertically spaced through-openings in fluid communication with said chamber and the membrane module, wherein, in use, gas is supplied to the chamber and communicated to the membrane module through at least the upper of said through-openings to aerate the membranes within the membrane module and liquid backwash is withdrawn from and/or fed into the membrane module through the lower of said through-openings into said chamber.

13. (previously presented) A porous membrane filtration module according to claim 11 wherein a filtrate connection pipe is provided in fluid communication between the upper and lower filtrate collection chambers and filtrate is withdrawn from one or the other of the collection chambers.
14. (previously presented) A porous membrane filtration module according to claim 11 wherein the aeration/backwash device is located adjacent the lower header.
15. (previously presented) A porous membrane filtration module according to claim 11 wherein the upper and lower collection chambers include respective upper and lower collection cups adapted to detachably receive and engage in a fluid-tight manner said upper and lower headers.
16. (previously presented) A porous membrane filtration module according to claim 15 wherein the headers are lockably engaged with the collection cups by means of a bayonet-type fitting.
17. (previously presented) A porous membrane filtration module according to claim 11 further including a screen which at least partially surrounds said membranes.
18. (previously presented) A porous membrane filtration module according to claim 17 wherein the screen is a sleeve which extends along part of the length of the membranes.
19. (previously presented) A porous membrane filtration module according to claim 17 wherein the screen is solid.
20. (previously presented) A porous membrane filtration module according to claim 17 wherein the screen is located above said aeration/backwash device.

21. (previously presented) A porous membrane filtration module according to claim 19 wherein the screen extends along the full length of the membrane module and is provided with one or more openings adjacent the through-openings of the aeration/backwash device to allow communication with the membranes and one or more additional openings at or adjacent the top of the module to allow flow of gas of liquid therethrough.

22. (previously presented) A porous membrane filtration module according to claim 21 having one or more further openings in said screen at or adjacent the aeration/backwash device to allow bypass of backwash flow.

23. (withdrawn) A method of removing contaminant material from a feed liquid using a porous membrane filtration module according to claim 11 including the steps of:

- (a) performing a filtration operation wherein feed containing contaminant matter is applied to one side of the membrane wall and filtrate is withdrawn from the other side of the membrane wall,

- (b) communicating said withdrawn filtrate through at least one of the upper and/or lower headers to at least one of the upper and/or lower collection chambers,

- (c) supplying gas to the communication chamber and communicating said gas to the membrane module through said through-openings to aerate the membranes within the membrane module;

- (d) backwashing said membrane wall using a liquid;

- (e) withdrawing liquid backwash from the membrane module through said through-openings into said communication chamber.

24. (withdrawn) A method according to claim 23 wherein the gas and liquid backwash are selectively communicated and withdrawn through the same through-openings.

25. (withdrawn) A method according to claim 24 wherein the gas is supplied to the chamber and communicated to the membrane module through the upper of said through-openings to aerate the membranes within the membrane module and liquid backwash is withdrawn from and/or fed into the membrane module through at least the lower of said through-openings into said chamber.
26. (withdrawn) A method according to 23 including feeding the backwash or feed liquid into the base of the module through the lower openings or both set of openings.
27. (withdrawn) A method according to claim 23 including using the backwash and/or feed liquid to sweep solids along the membranes to carry out solids removed from the membrane surfaces during said aeration.
28. (withdrawn) A method according to claim 23 wherein the membrane module is submerged in feed liquid contained within a vessel and including the step of flushing backwash waste containing the solids from the vessel by overflowing at the top of the vessel.
29. (withdrawn) A method according to claim 23 including the step of flushing backwash waste containing the solids from the module by overflowing at the top of the module.
30. (withdrawn) A method according to claim 23 including the step of flushing backwash waste containing the solids from the module by draining or pumping the waste from the module through the openings.
31. (withdrawn) A method according to claim 27 including the step of introducing gas into the module during said flushing step.
32. (withdrawn) A method according to claim 31 wherein said gas is mixed with said backwash and/or feed liquid.

33. (withdrawn) A method according to claim 31 wherein said gas is introduced to said communication chamber.